



SEQUENCE LISTING

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OCT 16 2002

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<110> Vaisvila, Romualdus
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<120> Method For Cloning And Producing The MseI Restriction
Endonuclease

<130> NEB-181

<140> US 09/689,343

<141> 2000-10-12

<160> 9

<170> PatentIn version 3.1

<210> 1

<211> 903

<212> DNA

<213> Micrococcus sp.

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<222> (1)..(900)

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gag gcg gac aac ctc gat ttc att caa acg ctc ccc gac gcg agc ttc 96
Glu Ala Asp Asn Leu Asp Phe Ile Gln Thr Leu Pro Asp Ala Ser Phe
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cga atg atc tac atc gat ccg ccg ttc aac aca ggg cga acg cag cgg 144
Arg Met Ile Tyr Ile Asp Pro Pro Phe Asn Thr Gly Arg Thr Gln Arg
35 40 45

ctt cag tcg ctc aag acg acc cgc tcg gtc aca ggg tcg cga gtc ggc 192
Leu Gln Ser Leu Lys Thr Thr Arg Ser Val Thr Gly Ser Arg Val Gly
50 55 60

ttc aaa ggc cag acg tac gac acg gtc aag agc act ctg cac tcg tat 240
Phe Lys Gly Gln Thr Tyr Asp Thr Val Lys Ser Thr Leu His Ser Tyr
65 70 75 80

gac gac gct ttc acc gac tat tgg tcg ttc ctc gaa ccg cgt ctc ctg 288
Asp Asp Ala Phe Thr Asp Tyr Trp Ser Phe Leu Glu Pro Arg Leu Leu
85 90 95

gag gct tgg cgg ttg ctc acc cct gac ggc gcg ctc tat ctt cat ctg	336
Glu Ala Trp Arg Leu Leu Thr Pro Asp Gly Ala Leu Tyr Leu His Leu	
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gat tac cgc gag gtt cac tac gcc aag gtc gtc ctc gac gcg atg ttc	384
Asp Tyr Arg Glu Val His Tyr Ala Lys Val Val Leu Asp Ala Met Phe	
115 120 125	
gga cgc gaa agc ttc ctg aac gag ctg atc tgg gcg tac gac tac ggc	432
Gly Arg Glu Ser Phe Leu Asn Glu Leu Ile Trp Ala Tyr Asp Tyr Gly	
130 135 140	
gcg cgc tcg aag agc aag tgg ccc acc aag cac gac aac atc ctc gtg	480
Ala Arg Ser Lys Ser Lys Trp Pro Thr Lys His Asp Asn Ile Leu Val	
145 150 155 160	
tat gtg aag gac ccg aac aac tac gtc tgg aac ggt cag gat gta gat	528
Tyr Val Lys Asp Pro Asn Asn Tyr Val Trp Asn Gly Gln Asp Val Asp	
165 170 175	
cgc gag ccc tac atg gcg ccc ggg ctc gtt aca ccc gag aag gta gcg	576
Arg Glu Pro Tyr Met Ala Pro Gly Leu Val Thr Pro Glu Lys Val Ala	
180 185 190	
ctt ggc aag ctg ccc acc gac gtc tgg tgg cac aca atc gtt ccg cct	624
Leu Gly Lys Leu Pro Thr Asp Val Trp Trp His Thr Ile Val Pro Pro	
195 200 205	
gcg agc aaa gag cgc acc ggg tac gcg aca cag aag ccg gtc ggc atc	672
Ala Ser Lys Glu Arg Thr Gly Tyr Ala Thr Gln Lys Pro Val Gly Ile	
210 215 220	
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Ile Arg Arg Met Ile Gln Ala Ser Ser Asn Glu Gly Asp Trp Val Leu	
225 230 235 240	
gat ttc ttc gct ggt agt ggg acg acc ggc gcc gcg gcc cgc cag ctc	768
Asp Phe Phe Ala Gly Ser Gly Thr Thr Gly Ala Ala Ala Arg Gln Leu	
245 250 255	
gga cgc cgt ttt gtg ctc gta gac gtc aac cca gaa gca atc gcg gta	816
Gly Arg Arg Phe Val Leu Val Asp Val Asn Pro Glu Ala Ile Ala Val	
260 265 270	
atg gca aaa cgg ttg gat gac ggg gca ttg gac acc agc gtg acg atc	864
Met Ala Lys Arg Leu Asp Asp Gly Ala Leu Asp Thr Ser Val Thr Ile	
275 280 285	
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<212> PRT

<213> Micrococcus sp.

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Gly	Arg	Glu	Ser	Phe	Leu	Asn	Glu	Leu	Ile	Trp	Ala	Tyr	Asp	Tyr	Gly	
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Arg	Glu	Pro	Tyr	Met	Ala	Pro	Gly	Leu	Val	Thr	Pro	Glu	Lys	Val	Ala	
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	210					215					220					
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Asp	Phe	Phe	Ala	Gly	Ser	Gly	Thr	Thr	Gly	Ala	Ala	Ala	Arg	Gln	Leu	
				245					250					255		
Gly	Arg	Arg	Phe	Val	Leu	Val	Asp	Val	Asn	Pro	Glu	Ala	Ile	Ala	Val	
			260					265					270			
Met	Ala	Lys	Arg	Leu	Asp	Asp	Gly	Ala	Leu	Asp	Thr	Ser	Val	Thr	Ile	
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acc tcc ttg cat ctg gag agt gtg gtc act gag gga gcg gag tca ccg 96
 Thr Ser Leu His Leu Glu Ser Val Val Thr Glu Gly Ala Glu Ser Pro
 20 25 30

cct aat cgt ctg att tgg gcg gac aac ctg ccg cta atg gta gat ttg 144
 Pro Asn Arg Leu Ile Trp Ala Asp Asn Leu Pro Leu Met Val Asp Leu
 35 40 45

ttg gcc gaa tat gaa ggg aaa atc gat ctg atc tac gcc gat ccc cct 192
 Leu Ala Glu Tyr Glu Gly Lys Ile Asp Leu Ile Tyr Ala Asp Pro Pro
 50 55 60

ttt ttt acg gat cgt act tat gcg gcg cga att ggt cat ggg gag gat 240
 Phe Phe Thr Asp Arg Thr Tyr Ala Ala Arg Ile Gly His Gly Glu Asp
 65 70 75 80

tcg cgt cgt cca caa acc tgg cag ctt gca gaa gga tat acg gac gag 288
 Ser Arg Arg Pro Gln Thr Trp Gln Leu Ala Glu Gly Tyr Thr Asp Glu
 85 90 95

tgg aag gat tta gat gaa tac ctg gac ttc ctt tat cca cgc ctg gta 336
 Trp Lys Asp Leu Asp Glu Tyr Leu Asp Phe Leu Tyr Pro Arg Leu Val
 100 105 110

ctg atg tat cga ctg ctg gca cca cac gga acg ctc tac ttg cac ctg	384
Leu Met Tyr Arg Leu Leu Ala Pro His Gly Thr Leu Tyr Leu His Leu	
115 120 125	
gac tgg cac gcc aat gcc tac gta cgt gta ctg ctt gat gag atc ttc	432
Asp Trp His Ala Asn Ala Tyr Val Arg Val Leu Leu Asp Glu Ile Phe	
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ggg cga cag cgg ttt ctc aac gag atc gtc tgg atc tat cac ggc ccc	480
Gly Arg Gln Arg Phe Leu Asn Glu Ile Val Trp Ile Tyr His Gly Pro	
145 150 155 160	
tca gcc atc cga cgc gcc ttc aag cgc aaa cat gat acc atc ttg gtt	528
Ser Ala Ile Arg Arg Ala Phe Lys Arg Lys His Asp Thr Ile Leu Val	
165 170 175	
tat gtg aaa ggt gaa aac tat aca ttc aat gcg gat gcg gtt cgt caa	576
Tyr Val Lys Gly Glu Asn Tyr Thr Phe Asn Ala Asp Ala Val Arg Gln	
180 185 190	
cct tac cat ccg agc acn cat aag acc ttc gct tcc tcc ccg aag gcc	624
Pro Tyr His Pro Ser Xaa His Lys Thr Phe Ala Ser Ser Pro Lys Ala	
195 200 205	
ggc ttt ggt aag gtg ccg gat ctg cag cgc ggc aaa gtg ccc gaa gac	672
Gly Phe Gly Lys Val Pro Asp Leu Gln Arg Gly Lys Val Pro Glu Asp	
210 215 220	
tgg tgg tat ttt ccg gtc gtg gcc cgt cta cac cga gaa cgg agc ggc	720
Trp Trp Tyr Phe Pro Val Val Ala Arg Leu His Arg Glu Arg Ser Gly	
225 230 235 240	
tat ccg act caa aag cct caa gcc ttg ctg gag cgg atc ctg ctg gcc	768
Tyr Pro Thr Gln Lys Pro Gln Ala Leu Leu Glu Arg Ile Leu Leu Ala	
245 250 255	
tcc tcg aac gca ggc gat ctg gtg gca gac ttc ttc tgc ggc tca ggg	816
Ser Ser Asn Ala Gly Asp Leu Val Ala Asp Phe Phe Cys Gly Ser Gly	
260 265 270	
aca acc gct gtg gtg gca gcc cgt ctg gga cgg cgc ttc ctg gtc aac	864
Thr Thr Ala Val Val Ala Ala Arg Leu Gly Arg Arg Phe Leu Val Asn	
275 280 285	
gat gca agc tgg cgc gcc gtt cat gtg aca cgc aca cgc ttg cta cgc	912
Asp Ala Ser Trp Arg Ala Val His Val Thr Arg Thr Arg Leu Leu Arg	
290 295 300	
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Glu Gly Val Ser Phe Thr Phe Glu Arg Gln Glu Thr Phe Thr Leu Pro	
305 310 315 320	
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Ile Gln Pro Leu Pro Pro Asp Trp Leu Ile Ile Ala Glu Glu Gln Ile	
325 330 335	

cgc ctc caa gca ccc ttt ctc gta gat ttt tgg gaa gtg gac gat caa	1056
Arg Leu Gln Ala Pro Phe Leu Val Asp Phe Trp Glu Val Asp Asp Gln	
340 345 350	

tgg gat ggc aaa atc ttc cgc agc cgt cat caa ggc tta cgc tcc cgc	1104
Trp Asp Gly Lys Ile Phe Arg Ser Arg His Gln Gly Leu Arg Ser Arg	
355 360 365	

ctt cag gag cag gcg ccg ctc tct cta cca ttg acc ggg aat gga ctg	1152
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370 375 380	

ttg tgt gta cgg gta gtg agc cgt gaa ggg gaa tac tat gag ttc aca	1200
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35 40 45

Leu Ala Glu Tyr Glu Gly Lys Ile Asp Leu Ile Tyr Ala Asp Pro Pro
50 55 60

Phe Phe Thr Asp Arg Thr Tyr Ala Ala Arg Ile Gly His Gly Glu Asp
65 70 75 80

Ser Arg Arg Pro Gln Thr Trp Gln Leu Ala Glu Gly Tyr Thr Asp Glu
85 90 95

Trp Lys Asp Leu Asp Glu Tyr Leu Asp Phe Leu Tyr Pro Arg Leu Val
100 105 110

Leu	Met	Tyr	Arg	Leu	Leu	Ala	Pro	His	Gly	Thr	Leu	Tyr	Leu	His	Leu	115	120	125
Asp	Trp	His	Ala	Asn	Ala	Tyr	Val	Arg	Val	Leu	Leu	Asp	Glu	Ile	Phe	130	135	140
Gly	Arg	Gln	Arg	Phe	Leu	Asn	Glu	Ile	Val	Trp	Ile	Tyr	His	Gly	Pro	145	150	155
Ser	Ala	Ile	Arg	Arg	Ala	Phe	Lys	Arg	Lys	His	Asp	Thr	Ile	Leu	Val	165	170	175
Tyr	Val	Lys	Gly	Glu	Asn	Tyr	Thr	Phe	Asn	Ala	Asp	Ala	Val	Arg	Gln	180	185	190
Pro	Tyr	His	Pro	Ser	Xaa	His	Lys	Thr	Phe	Ala	Ser	Ser	Pro	Lys	Ala	195	200	205
Gly	Phe	Gly	Lys	Val	Pro	Asp	Leu	Gln	Arg	Gly	Lys	Val	Pro	Glu	Asp	210	215	220
Trp	Trp	Tyr	Phe	Pro	Val	Val	Ala	Arg	Leu	His	Arg	Glu	Arg	Ser	Gly	225	230	235
Tyr	Pro	Thr	Gln	Lys	Pro	Gln	Ala	Leu	Leu	Glu	Arg	Ile	Leu	Leu	Ala	245	250	255
Ser	Ser	Asn	Ala	Gly	Asp	Leu	Val	Ala	Asp	Phe	Phe	Cys	Gly	Ser	Gly	260	265	270
Thr	Thr	Ala	Val	Val	Ala	Ala	Arg	Leu	Gly	Arg	Arg	Phe	Leu	Val	Asn	275	280	285
Asp	Ala	Ser	Trp	Arg	Ala	Val	His	Val	Thr	Arg	Thr	Arg	Leu	Leu	Arg	290	295	300
Glu	Gly	Val	Ser	Phe	Thr	Phe	Glu	Arg	Gln	Glu	Thr	Phe	Thr	Leu	Pro	305	310	315
Ile	Gln	Pro	Leu	Pro	Pro	Asp	Trp	Leu	Ile	Ile	Ala	Glu	Glu	Gln	Ile	325	330	335
Arg	Leu	Gln	Ala	Pro	Phe	Leu	Val	Asp	Phe	Trp	Glu	Val	Asp	Asp	Gln	340	345	350
Trp	Asp	Gly	Lys	Ile	Phe	Arg	Ser	Arg	His	Gln	Gly	Leu	Arg	Ser	Arg	355	360	365
Leu	Gln	Glu	Gln	Ala	Pro	Leu	Ser	Leu	Pro	Leu	Thr	Gly	Asn	Gly	Leu	370	375	380
Leu	Cys	Val	Arg	Val	Val	Ser	Arg	Glu	Gly	Glu	Tyr	Tyr	Glu	Phe	Thr	385	390	395
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gcc gac aac atg gaa gtc ctg cga ggg ctt ccg gcg gcg tcc gtg gac	96
Ala Asp Asn Met Glu Val Leu Arg Gly Leu Pro Ala Ala Ser Val Asp	
20 25 30	
ctg atc tac atc gat cct ccg ttc aac acc gga aag gtt cag gag cgc	144
Leu Ile Tyr Ile Asp Pro Pro Phe Asn Thr Gly Lys Val Gln Glu Arg	
35 40 45	
act cag ctc aaa acg gtg cgc tcc gag tgg ggc gat cgc gtc gga ttc	192
Thr Gln Leu Lys Thr Val Arg Ser Glu Trp Gly Asp Arg Val Gly Phe	
50 55 60	
cag ggc cgt cgc tac gaa agc atc gtc gtg ggt aag aag cgc ttt acc	240
Gln Gly Arg Arg Tyr Glu Ser Ile Val Val Gly Lys Lys Arg Phe Thr	
65 70 75 80	
gac ttc ttc gac gac tat ctg gct ttc ctg gaa ccg cgc ctg gtc gaa	288
Asp Phe Phe Asp Asp Tyr Leu Ala Phe Leu Glu Pro Arg Leu Val Glu	
85 90 95	
gcc cat cgt gtt ctg gcg ccg cac ggg tgc ctc tac ttt cac gtc gac	336
Ala His Arg Val Leu Ala Pro His Gly Cys Leu Tyr Phe His Val Asp	
100 105 110	
tac cgc gag gtg cac tac tgt aag gtc ctt ctt gac ggc atc ttc ggt	384
Tyr Arg Glu Val His Tyr Cys Lys Val Leu Leu Asp Gly Ile Phe Gly	
115 120 125	
cgc gag gcc ttt ctc aac gag atc atc tgg gcc tac gat tac ggc ggg	432
Arg Glu Ala Phe Leu Asn Glu Ile Ile Trp Ala Tyr Asp Tyr Gly Gly	
130 135 140	
cgt ccg aag gac agg tgg cct cct aag cac gac aac atc ctg ctc tac	480
Arg Pro Lys Asp Arg Trp Pro Pro Lys His Asp Asn Ile Leu Leu Tyr	
145 150 155 160	

gcc aag act ccc ggt cgc cac gtg ttc aat gcg gac gaa atc gag cgc Ala Lys Thr Pro Gly Arg His Val Phe Asn Ala Asp Glu Ile Glu Arg 165 170 175	528
att ccc tac atg gct ccg ggc ctg gtt ggc ccc gaa aag gca gcc cgt Ile Pro Tyr Met Ala Pro Gly Leu Val Gly Pro Glu Lys Ala Ala Arg 180 185 190	576
gga aaa ctg cca acc gac acg tgg tgg cat acg atc gtt ccg acc agc Gly Lys Leu Pro Thr Asp Thr Trp Trp His Thr Ile Val Pro Thr Ser 195 200 205	624
ggc tcc gag aag acc ggg tat cca acc cag aaa cct tta ggg att ctc Gly Ser Glu Lys Thr Gly Tyr Pro Thr Gln Lys Pro Leu Gly Ile Leu 210 215 220	672
cgc cgt att gtg cag gca tcg tct cat ccg ggg gca gtc gtg ctc gac Arg Arg Ile Val Gln Ala Ser Ser His Pro Gly Ala Val Val Leu Asp 225 230 235 240	720
ttc ttc gcc ggc agt ggg aca aca ggg gta gcg gct ttt gag ttg ggc Phe Phe Ala Gly Ser Gly Thr Thr Gly Val Ala Ala Phe Glu Leu Gly 245 250 255	768
cgg cgt ttc att ctg gtc gat aac cat ccg gag gcc ctc cag gtg atg Arg Arg Phe Ile Leu Val Asp Asn His Pro Glu Ala Leu Gln Val Met 260 265 270	816
gcc agg cgc ttc gac ggc atc gag ggg atc gaa tgg gtg ggc ttc gat Ala Arg Arg Phe Asp Gly Ile Glu Gly Ile Glu Trp Val Gly Phe Asp 275 280 285	864
ccg aca ccg tac cag aag ggc gca aag cag cgc cgc tcc tgc ccg gcg Pro Thr Pro Tyr Gln Lys Gly Ala Lys Gln Arg Ser Arg Ser Cys Pro Ala 290 295 300	912
ccc acc ggg taa Pro Thr Gly 305	924

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 35 40 45
 Thr Gln Leu Lys Thr Val Arg Ser Glu Trp Gly Asp Arg Val Gly Phe
 50 55 60
 Gln Gly Arg Arg Tyr Glu Ser Ile Val Val Gly Lys Lys Arg Phe Thr
 65 70 75 80
 Asp Phe Phe Asp Asp Tyr Leu Ala Phe Leu Glu Pro Arg Leu Val Glu
 85 90 95
 Ala His Arg Val Leu Ala Pro His Gly Cys Leu Tyr Phe His Val Asp
 100 105 110
 Tyr Arg Glu Val His Tyr Cys Lys Val Leu Leu Asp Gly Ile Phe Gly
 115 120 125
 Arg Glu Ala Phe Leu Asn Glu Ile Ile Trp Ala Tyr Asp Tyr Gly Gly
 130 135 140
 Arg Pro Lys Asp Arg Trp Pro Pro Lys His Asp Asn Ile Leu Leu Tyr
 145 150 155 160
 Ala Lys Thr Pro Gly Arg His Val Phe Asn Ala Asp Glu Ile Glu Arg
 165 170 175
 Ile Pro Tyr Met Ala Pro Gly Leu Val Gly Pro Glu Lys Ala Ala Arg
 180 185 190
 Gly Lys Leu Pro Thr Asp Thr Trp Trp His Thr Ile Val Pro Thr Ser
 195 200 205
 Gly Ser Glu Lys Thr Gly Tyr Pro Thr Gln Lys Pro Leu Gly Ile Leu
 210 215 220
 Arg Arg Ile Val Gln Ala Ser Ser His Pro Gly Ala Val Val Leu Asp
 225 230 235 240
 Phe Phe Ala Gly Ser Gly Thr Thr Gly Val Ala Ala Phe Glu Leu Gly
 245 250 255
 Arg Arg Phe Ile Leu Val Asp Asn His Pro Glu Ala Leu Gln Val Met
 260 265 270
 Ala Arg Arg Phe Asp Gly Ile Glu Gly Ile Glu Trp Val Gly Phe Asp
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 Pro Thr Gly
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tgg gtc ggc agc ccg ttc gag tgg atc ctt cgc gtt cca tcc aga acg Trp Val Gly Ser Pro Phe Glu Trp Ile Leu Arg Val Pro Ser Arg Thr 35 40 45	144
aag ggc gcg gtc ggt gag ctg ctc gtg agc gaa tgg gct aat gcc aaa Lys Gly Ala Val Gly Glu Leu Leu Val Ser Glu Trp Ala Asn Ala Lys 50 55 60	192
ggc ctc cgt gtg aag agg tcg ggg tcc agc gat gcg gac cgc gtg atc Gly Leu Arg Val Lys Arg Ser Gly Ser Ser Asp Ala Asp Arg Val Ile 65 70 75 80	240
aac ggg cat cgc atc gag atc aag atg tcg act ttg tgg aag tcc ggc Asn Gly His Arg Ile Glu Ile Lys Met Ser Thr Leu Trp Lys Ser Gly 85 90 95	288
ggc ttc aag ttt cag cag atc cgg gat cag gag tac gac ttt tgc ctc Gly Phe Lys Phe Gln Gln Ile Arg Asp Gln Glu Tyr Asp Phe Cys Leu 100 105 110	336
tgc ctt ggg atc agc ccg ttc gaa gtg cac gcg tgg ctg ctg ccc aaa Cys Leu Gly Ile Ser Pro Phe Glu Val His Ala Trp Leu Leu Pro Lys 115 120 125	384
gac cta ttg ctt gag tac gtg att ggt cac atg ggt cag cac acc ggc Asp Leu Leu Leu Glu Tyr Val Ile Gly His Met Gly Gln His Thr Gly 130 135 140	432
gcg agc ggg agc gac act gcg tgg ctg ggg ttc cca gcg gac gag ccg Ala Ser Gly Ser Asp Thr Ala Trp Leu Gly Phe Pro Ala Asp Glu Pro 145 150 155 160	480
tat gac tgg atg cgc cct ttc gga ggt cgc tta ggt cac gtc gaa gat Tyr Asp Trp Met Arg Pro Phe Gly Gly Arg Leu Gly His Val Glu Asp 165 170 175	528

ctc ctc ctc gcg gcc ggc ccc ggt ccc tac tga
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561

<210> 8
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Val Thr His Glu Pro Thr Asp Asp Pro Asp Phe Ile Val Met Ala Ala
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 35 40 45
 Lys Gly Ala Val Gly Glu Leu Leu Val Ser Glu Trp Ala Asn Ala Lys
 50 55 60
 Gly Leu Arg Val Lys Arg Ser Gly Ser Ser Asp Ala Asp Arg Val Ile
 65 70 75 80
 Asn Gly His Arg Ile Glu Ile Lys Met Ser Thr Leu Trp Lys Ser Gly
 85 90 95
 Gly Phe Lys Phe Gln Gln Ile Arg Asp Gln Glu Tyr Asp Phe Cys Leu
 100 105 110
 Cys Leu Gly Ile Ser Pro Phe Glu Val His Ala Trp Leu Leu Pro Lys
 115 120 125
 Asp Leu Leu Leu Glu Tyr Val Ile Gly His Met Gly Gln His Thr Gly
 130 135 140
 Ala Ser Gly Ser Asp Thr Ala Trp Leu Gly Phe Pro Ala Asp Glu Pro
 145 150 155 160
 Tyr Asp Trp Met Arg Pro Phe Gly Gly Arg Leu Gly His Val Glu Asp
 165 170 175
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D1
cancer